

KEY TO THE NEOTROPICAL GENERA OF PARYDRINAE
WITH A REVISION OF THE GENUS *ELELEIDES* CRESSON
(DIPTERA: EPHYDRIDAE)

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Abstract.—Mathis, W. N., Department of Entomology, National Museum of Natural History, NHB 169, Smithsonian Institution, Washington, D.C. 20560.—*Eleleides* Cresson is revised to include one new species, *E. liroceras* (type-locality, Hurlingham, Buenos Aires, Argentina). Characters of the head, thorax, and male and female postabdomens are illustrated. The genus is placed in the tribe Hyadinini, subfamily Parydrinae. Other Neotropical genera of Parydrinae are keyed and their relationships discussed.

Shore flies (ephydrids) of the Neotropics are very poorly known. Many undescribed taxa presently await description and revisionary study and numerous others undoubtedly remain to be discovered. Consequently, the classification of this fauna is in a preliminary state, subject to considerable change and revision with the addition of new taxa. The most recent catalogue of Neotropical Diptera (Wirth, 1968) lists three tribes, 11 genera, and 41 species for the subfamily Parydrinae. With few exceptions, most of these taxa were described in isolated descriptions, lacking keys or illustrations. Exceptions are the studies of Cresson (1931) on the fauna of southern Chile and Patagonia; Cresson (1934) on the genus *Beckeriella*; Cresson (1938) on the genera *Ochthera* and *Stenochthera*; Wirth (1958) on the genus *Gastrops*; and Wirth (1970) on the genus *Physemops*.

The purpose of the present paper is to provide a key to Neotropical genera of Parydrinae, to make some preliminary observations regarding the phylogeny and classification of the Central and South American fauna of this subfamily, and to revise the genus *Eleleides* Cresson.

Genera included in the key are those listed in the aforementioned catalogue with the addition of *Pelina* and *Diedrops*. A species of *Pelina* is now known to occur in the Neotropics (Clausen, 1973) and *Diedrops* was described from Mexican and Peruvian specimens since the publication of the catalogue (Mathis and Wirth, 1976).

Key to the genera of Neotropical Parydrinae (Ephydridae)

1. Eye pilose; facial height at middle subequal to that of clypeus; antenna small, inserted in widely separated cavities; arista rudimentary, length when visible approximately $\frac{1}{2}$ width of 3rd an-

- tenal segment; head and mesonotum mostly bare, lacking any prominent bristles; generally cinereous and dorsoventrally flattened *Lipochaeta* Coquillett
- Eye bare; face much higher than clypeus; antennal bases approximate, arista normally developed; head and mesonotum usually with some distinguishable bristles; shape and coloration not as above 2
 - 2. Face vertically carinate; costa extending to vein R 3 + 4; vein R 2 + 3 short, merging with costa before level of posterior crossvein; arista pectinate; arisal branches 7 to 11, longer ones equal to length of 3rd antennal segment *Brachydeutera* Loew
 - Face flat to convex, not vertically carinate; costa extending to vein M 1 + 2; vein R 2 + 3 longer, merging with costa at or beyond level of posterior crossvein; arista variable, bare or pectinate, if pectinate with fewer branches or longer branches not equal in length to 3rd antennal segment 3
 - 3. Oral opening large, gaping; clypeus prominent as a transverse band *Parydra* Stenhammer
 - Oral opening small to moderately large; clypeus variously exposed, usually tonguelike, not as transverse band 4
 - 4. Arista pectinate; mid tibia with a prominent ventroapical bristle 5
 - Arista bare to macropubescent; mid tibia lacking a prominent ventroapical bristle 9
 - 5. Arisal branches 3 to 4; wing hyaline; abdominal terga 2-4 subequal in width, pollinose but more or less smooth; halter capitellum pale 6
 - Arisal branches 7 or more; wing usually infuscated often with distinct maculation pattern; abdominal terga 3 and 4 enlarged, wider than 2, rugose or pitted; halter capitellum black 8
 - 6. Fore leg normal, with femur and tibia similar to those of mid and hind legs; chaetotaxy of head and mesonotum well developed; posterior crossvein perpendicular to vein M 1 + 2 *Eleleides* Cresson
 - Fore leg raptorial, with femur greatly enlarged and spinose below, tibial apex produced ventrally into a long, stout, extending spur; chaetotaxy of head and mesonotum reduced, mostly lacking; posterior crossvein merging with vein M 1 + 2 at acute angle 7
 - 7. Eye much higher than wide; gena very narrow, usually less than $\frac{1}{4}$ eye height; face relatively narrow, especially below antennal fovea, not vertically carinate or tuberculate *Stenochthera* Hendel
 - Eye only slightly higher than wide; gena wide, approximately $\frac{1}{2}$ eye height; face relatively wide, vertically carinate or tuberculate *Ochththera* Latreille
 - 8. Face flat or concave *Beckeriella* Williston

- Face with gently rounded, broad swelling on dorsal half
Gastrops Williston
- 9. Face broadly arched, shieldlike, sparsely setulose; clypeus concealed 10
- Face flat to convex but not shieldlike, mostly bare; clypeus variable, if exposed, tongue-like 11
- 10. Vein R 2 + 3 very long, ending in costa at about same level as R 4 + 5; arista shorter, length much less than width of frons just above antennae; halter discolored, dark but not distinctly black; larger species, usually more than 3 mm *Diedrops* Mathis and Wirth
- Vein R 2 + 3 shorter, ending in costa before R 4 + 5; arista longer, length subequal to width of frons just above antenna; halter capitellum black; small species, less than 3 mm *Physemops* Cresson
- 11. Vein R 2 + 3 longer, costal vein ratio 1:0.5 or less 12
- Vein R 2 + 3 shorter, costal vein ratio 1:0.8 or more 13
- 12. Gena large, height greater than $\frac{1}{2}$ eye height; only inner vertical bristle present; mostly brown, pollinose species *Pelionoides* Cresson
- Gena smaller, height much less than $\frac{1}{2}$ eye height; 1 pair of fronto-orbital bristles and both inner and outer vertical bristles present; mostly black, subshiny to shiny species *Pelina* Haliday
- 13. Fourth abdominal tergum longer than combined length of 2nd and 3rd terga; only inner vertical bristle evident *Lytogaster* Becker
- Fourth abdominal tergum shorter, not longer than combined length of 2nd and 3rd terga; vertical bristles variable, often outer present *Hyadina* Haliday

While constructing the key to Neotropical genera of Parydrinae, several problems became apparent that need further commentary. My comments must be considered preliminary in the sense that the problems addressed are not resolved beyond the suggestion of possibilities in most instances. My reasons for commenting now are to bring the problems to the forefront, to provide perspective, to point out the vast lacuna in our understanding of the Neotropical shore fly fauna, and to encourage further collection and study of Central and South American ephydrids.

Physemops and *Diedrops* are included in the key because recent studies (Wirth, 1968 and Mathis and Wirth, 1976, respectively) have assigned these genera to the subfamily Parydrinae. However, members of these genera plus those of *Dagus* Cresson (Neotropical), *Psilephydra* Hendel (Oriental), and *Apulvillus* Malloch (Polynesian) share many similarities (outlined below) and will probably form the basis of a taxon intermediate between Ephydriinae and Parydrinae or incorporated within the enlarged concept of either subfamily. Wirth (1970) correctly pointed out that *Physemops* and *Psilephydra* are similar to *Apulvillus*, a genus of the

tribe Scatellini (Ephydrinae). I have only added *Dagus* and *Diedrops* to the genera included in the group (hereafter denoted as *Physemops*-group). The face of members of these genera is projecting or shieldlike, concealing the clypeus, is arched, sparsely setulose, and is invested with silvery-white pubescence. Also, members of these genera have some, although often reduced, mesonotal (dorsocentral and acrostichal) and cephalic bristles, have a characteristically shortened frons, and aside from specimens of *Physemops*, have dull to subshiny-brown coloration dorsally and are contrastingly gray below with a rather sharp demarcation between the coloration change. The dorsal surface is usually dull, often pollinose, but is uniformly smooth. Specimens of *Physemops* differ by being entirely dark brown to black and shinier. This brief outline of characters contrasts with those of most genera of Parydrinae (*s. str.*) which are subshiny to shiny and have the cuticular surface, notably on the mesonotum, granulose to microrugose and for the most part lacking prominent bristles.

A direct relationship between the *Physemops*-group and Parydrinae (*s. str.*) is not established. However, the genus *Brachydeutera* is possibly intermediate. *Brachydeutera* specimens have coloration and cuticular surface similarities with members of the *Physemops*-group but also resemble those of the tribe Parydrini (Parydrinae), i.e. clypeus exposed, transverse and oral opening large, gaping. A second possible connection between the *Physemops*-group and Parydrinae is through *Eleleides*, the genus revised below. Members of *Eleleides*, like *Brachydeutera* are similar to those of the *Physemops*-group in coloration and surface texture; they also possess several well-developed dorsocentral and fronto-orbital bristles. Like other parydrine genera, especially *Ochthera* and *Stenochthera*, the clypeus of *Eleleides* specimens is exposed, appearing tonguelike through the ventral facial emargination. In addition, the overall appearance of *Eleleides* specimens is similar to that of *Pelinoides* specimens. From the above, it is obvious that the relationships of the *Physemops*-group with other ephydrid taxa are poorly known. An evaluation of pertinent characters, to determine their relative derived versus primitive states will be necessary before the sequence of lineages can be better clarified.

Ochthera and *Stenochthera* members are closely related as demonstrated by many synapomorphies (second half of key couplet 6). However, recognition of each as a distinct genus is questionable. *Stenochthera* was originally proposed by Hendel (1930), who used characters that are now known to vary considerably within members of *Ochthera* alone. Although *Stenochthera* specimens can generally be recognized as a distinct taxon in the Neotropics, there are few characters that are reliable for recognizing the group on a worldwide basis. However, the surstyli of the few *Stenochthera* species I examined were somewhat unique, having a median constriction, superficially dividing each surstylus into 2 parts.

My comments questioning the generic distinctiveness of *Ochthera* and *Stenochthera* also apply to *Beckeriella* and *Gastrops*. The only consistent character to distinguish between the latter 2 genera is the concave to slightly convex face of *Beckeriella* specimens as opposed to the upper facial tumescence in members of *Gastrops*. Cresson (1934:201) while reviewing the species of *Beckeriella*, also noted the close similarity between members of these genera, stating that "The structural similarity between the species of this genus and those of *Gastrops* is very marked, in fact, were it not for the flat to concave or slightly convex face of *Beckeriella* as opposed to the characteristically strongly convex to gibbose face of *Gastrops*, the two groups of species could almost be considered congeneric. The general structure of the head, thorax and abdomen is so similar in the two genera that their close relationship is evident." Fifteen years later, Cresson (1949) erected the tribe Gastropsini for these genera based on the distinctive conformation of their heads and pectinate arista. This tribe has not since been generally recognized (Wirth, 1968). Regardless of generic status however, these taxa are a monophyletic lineage as established by the synapomorphies cited in the key (second half of couplet 5).

Further classification of the relationships suggested above will depend on in depth studies of the genera in question. Undoubtedly there are many characters of the male and female postabdomen that will add considerably to a better understanding of the subfamilial and generic relationships.

Eleleides Cresson

Eleleides Cresson, 1948:20. Type-species: *Eleleides chloris* Cresson, by original designation and monotypy. Wirth, 1968:141-142 (review).

Diagnosis.—Members of *Eleleides* may be distinguished from those of similar genera of the subfamily Parydrinae by the following combination of characters: apical, spinelike seta of second antennal segment small, inconspicuous; arista with 3 to 5 branches above; eye bare; oral opening small; face with ventral margin deeply emarginate at middle; clypeus exposed, protruding through facial emargination; face much narrower than frons, mostly flat, at least lower portion densely pollinose; 1 pair of well-developed, crucinate facial bristles; 1 pair of larger fronto-orbital bristles with lateral posteroblique orientation; dorsocentral bristles well developed, 2 pairs (1 + 1); fore legs normally developed, similar to mid and hind legs; fore femur with anteroventral series of minute, closely spaced, short, flattened denticles; mid tibia lacking dorsal erect extensor bristles; wing hyaline; posterior crossvein perpendicular to vein M_{1+2} ; most of abdomen shiny, with metallic green to dark bluish-green coloration.

Description.—Small ephydrids, length approximately 2 mm; generally

dark colored above, pollinose to shiny; pleural areas contrastingly lighter in coloration, distinctly pollinose.

Head: Slightly wider than high; frons wider than long, trapezoidal in shape becoming narrower anteriorly; mesofrons not obviously distinct from parafrons in color or texture; ocelli arranged in isocles triangle, distance between posterior pair longer than between either posterior ocellus and median ocellus; chaetotaxy of frons as follows: proclinate fronto-orbitals 2 pairs, posterior pair much smaller; latero-clinate fronto-orbital large, inserted medially to proclinate fronto-orbitals, close to posterior fronto-orbital; both inner and outer vertical bristles well developed, distance between them less than between inner vertical and posterior fronto-orbital, the latter distance subequal to distance between posterior ocelli; 1 pair of large, proclinate, parallel ocellar bristles; dorsalmost pair of postocular bristles more prominent, stronger, several smaller bristles along posterior margin of eye. Second antennal segment with a short bristle above and several less evident setae on ventral and median surfaces; third antennal segment as wide as long; arista slightly enlarged basally, macropubescent, stylelike apically, with 3-4 branches above. Face flat in profile, higher than width between eyes, becoming considerably broader ventrally; uniformly textured, densely pollinose, and colored; deeply emarginate along ventral edge at middle, exposing clypeus and maxillary palps; facial bristles large, cruciate, 1 pair at level of ventral margin of eye, otherwise face mostly bare. Parafacials gradually becoming wider ventrally. Eye bare, almost as wide as high, suboval, oriented at slight oblique angle to epistoma. Gena wide to narrow, bearing 1 large bristle and several smaller ones toward postero-ventral edge of head; maxillary palp spatulate; oral opening small, prementum narrow, shiny.

Thorax: Dark colored above, pollinose to shiny, becoming shinier posteriorly; pleural areas distinctly contrasting with mesonotum, lighter, more pollinose. Thoracic chaetotaxy as follows: acrostichal bristles generally inconspicuous except for 1 pair of widely separated prescutellars, occasionally with 1 larger pair at sutural level; 2 pairs of dorsocentral bristles (1 + 1); 1 pair of presutural bristles; 1 or 2 pairs of supra-alar bristles; 1 pair of intralar bristles; 1 pair of humeral bristles; 2 pairs of notopleural bristles, both inserted at same distance from ventral notopleural margin; 2 pairs of larger lateral scutellars, apical pair slightly larger, with 1 pair of much smaller bristles between larger scutellars; 2 pairs of larger mesopleural bristles along posterior margin; 1 pair of sternopleural bristles; otherwise pleural areas mostly bare. Legs more or less subequal to each other, normal, femora not greatly enlarged; mid tibia with prominent ventroapical bristle. Wing hyaline; costal vein extending to vein M_{1+2} . Halter pale.

Abdomen: Shiny dorsally with metallic reflections; terga 2-4 sub-

equal in length, fifth slightly shorter. Female with 6 visible terga; segments 1-7 complete but with distinctly larger membranous gap between segments 6 and 7 than between first 6 segments. Ventral receptacle with operculum much higher than wide, extending process simple. Male genitalia symmetrical, cercus prominent, long; posterior surstylus large, attached but not fused indistinguishably with ventral margin of epandrium; anterior surstylus prominent, setulose; aedeagus wide basally, sometimes terminating with long crescent-shaped, narrow process.

Geographic distribution.—Disjunct; southeastern Australia and northeastern Argentina. I suspect that with more thorough collecting, the genus will be found to be more widespread than is presently indicated and that additional species will be discovered. Moreover, I suggest that western South America and possibly temperate Africa will be productive in this regard. Based on the known disjunct distribution, however, the possibility that one or the other species was introduced must also be considered.

Discussion.—Members of the genus *Eleleides* have close affinities with genera of the tribe Hyadinini sensu Wirth and Stone (1956) of the subfamily Parydrinae and are being placed in this tribe, despite similarities *Eleleides* has with genera of Typopsilopini (Notiphilinae), the tribe in which Cresson (1948) originally described the genus. The relationship of *Eleleides* with Hyadinini is evidenced by the following character states, exhibited in *Eleleides* specimens and also used to recognize the tribe: eye bare; antenna normally developed; arista present, well developed, with 3-5 branches above; 1 larger pair of fronto-orbital bristles with a later-oblique orientation; oral opening small to moderately large; and clypeus exposed through facial emargination, but not prominent as a large transverse band.

Within the tribe Hyadinini, *Eleleides* appears to be allied with *Ochthera* and *Stenochthera* and it is probably the sister-group of the latter genera and perhaps to the remaining genera of Hyadinini. The relationship between members of *Ochthera* + *Stenochthera* and those of *Eleleides* is based on the joint possession of sparsely branched, pectinate arista; the occurrence of a rather large, pendulous posterior surstylus that is not fused to the ventral margin of the epandrium; the row of cuticular, peglike denticles along the venter of the fore femur, and the general features of the head, especially the deeply emarginate ventral edge of the face through which the clypeus protrudes. Specimens of *Eleleides* may be readily distinguished from either *Ochthera* or *Stenochthera* by the unusually well-developed chaetotaxy of the head and thorax, particularly the large fronto-orbital and prominent dorsocentral bristles and by the normally developed fore leg. The strongly developed chaetotaxy is unique among most Parydrinae genera and distinguishes specimens of *Eleleides* from all others.

Eleleides liroceras, new species

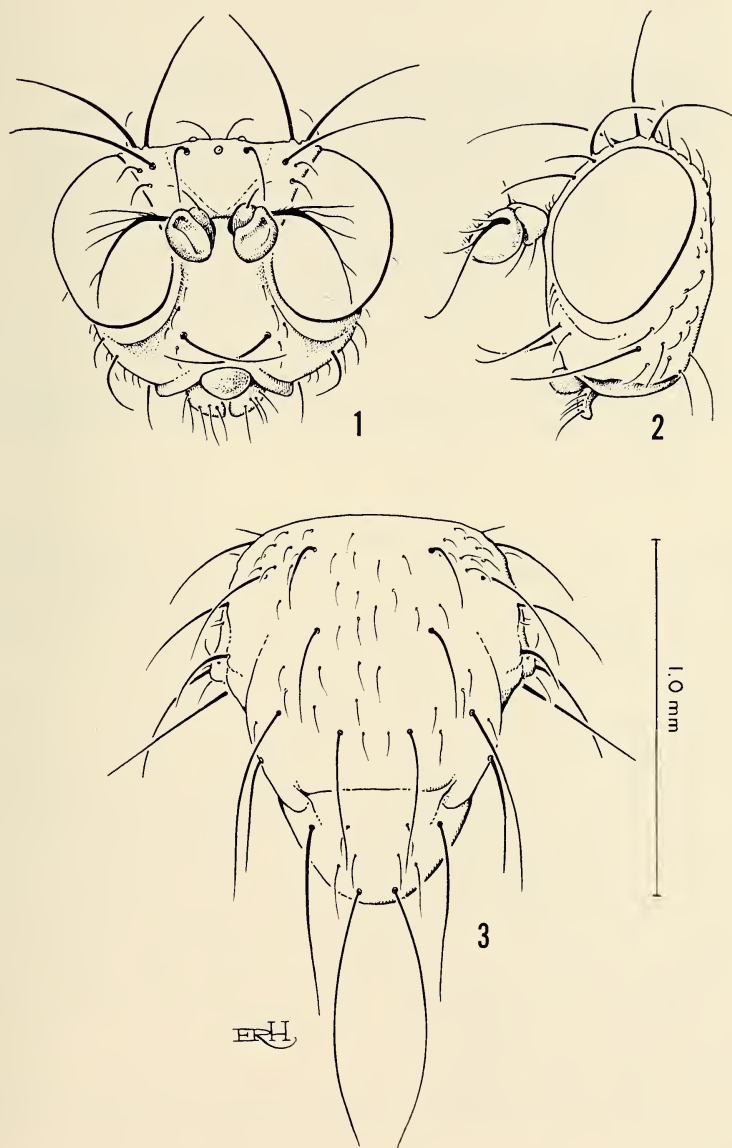
Figs. 1-10

Diagnosis.—Specimens of *E. liroceras* are distinguished by the following combination of characters: eye-to-cheek ratio more than 1:0.40; third antennal segment pale, yellowish orange to orange; frons subshiny, with bronzish-brown, pollinose vestiture except for cinereous anterior margin; face unicolorous, gray to silvery gray; maxillary palp pale, yellowish orange; anterior portion of mesonotum dull, concolorous with frons, becoming subshiny to shiny, darker, more greenish blue posteriorly; bristles in general more strongly developed; no larger pairs of acrostichal bristles; anterior supralar bristle lacking; tibiae pale, concolorous with basal tarsomeres, contrasting distinctly with darker femora; abdominal terga with lateral cinereous wedges, these contrasting with subshiny to shiny areas.

Description.—Length 1.84 to 2.48 mm (averaging 2.16 mm).

Head (Figs. 1 and 2): Head width-to-height ratio averaging 1:0.78; frons width-to-length ratio averaging 1:0.60; frons mostly subshiny black with dense bronzish-brown pollinose vestiture that becomes contrastingly gray along anterior margin. Fronto-orbital plates and mesofrons slightly raised in relief and shinier. First and second antennal segments dark brown, dull; third segment as wide as long, entirely pale, orange, macropubescent along rounded apical edge. Face and gena concolorous, entirely gray to silvery gray, face height-to-width ratio averaging 1:0.60; clypeus black, not as gray pollinose as face; maxillary palp entirely pale yellow. Eye height-to-width ratio averaging 1:0.94; eye-to-cheek ratio averaging 1:0.42; ventral portion of gena with a shallowly impressed groove running parallel with edge.

Thorax (Fig. 3): Black, covered with pollinose vestiture; mesonotum with anterior portion dull, brown; humerus and notopleuron concolorous gray, contrasting distinctly with brown mesonotum, both posterior portions and scutellum shinier, darker, bronzish; scutellum mostly bare, with very few scattered small setae, slightly rounded. Pleural areas entirely pollinose, gray, unicolorous. Femora black but with rather dense covering of gray pollinosity, concolorous; apical half of anteroventral edge of fore femur with row of small peglike cuticular bumps best seen in silhouette; tibiae concolorous, mostly pale, tawny but with basal half of dorsal surface invested with silvery-gray pollinosity, mid tibia with larger, ventroapical bristle; hind tibia of some specimens with a long, stout, spinelike, preapical, ventral bristle; basal tarsomeres concolorous with tibial apices, becoming darker apically, apical 2 tarsomeres dark brown. Wing (Fig. 4) entirely hyaline; length-to-width ratio averaging 1:0.45; costal vein ratio averaging 1:0.60; M_{1+2} vein ratio averaging 1:0.70; posterior crossvein perpendicular with vein M_{1+2} . Halter pale, whitish-yellow.



Figs. 1-3. *Eleleides lirocceras*: 1, Head, frontal view; 2, Same, lateral view; 3, Thorax, dorsal view.



Fig. 4. *Eleleides liroceras*: 4, Wing.

Abdomen: Shiny above with metallic dark brown to bronzish-brown reflections; often with small triangular pollinose gray wedges on lateral margins, variable, many specimens lacking any indication of gray on sides. Sterna 1-6 of female as in Fig. 5; female ventral receptacle as in Figs. 6 and 7. Male genitalia as in generic diagnosis and in Figs. 8, 9, and 10.

Type-material.—Holotype female, labelled: "ARGENTINA: Province of Buenos Aires, Hurlingham, 26-X-73, D H Habeck, sweeping." Allotype (in poor condition) and 12 paratypes (all ♀♀), with the same label data as the holotype. The holotype (USNM type number 74162), allotype, and 4 paratypes were donated to the National Museum of Natural History, Smithsonian Institution, by the Florida State Collection of Arthropods, Gainesville, Florida. The remaining paratypes will be returned to the latter institution.

Geographic distribution.—Presently known from the type-locality only.

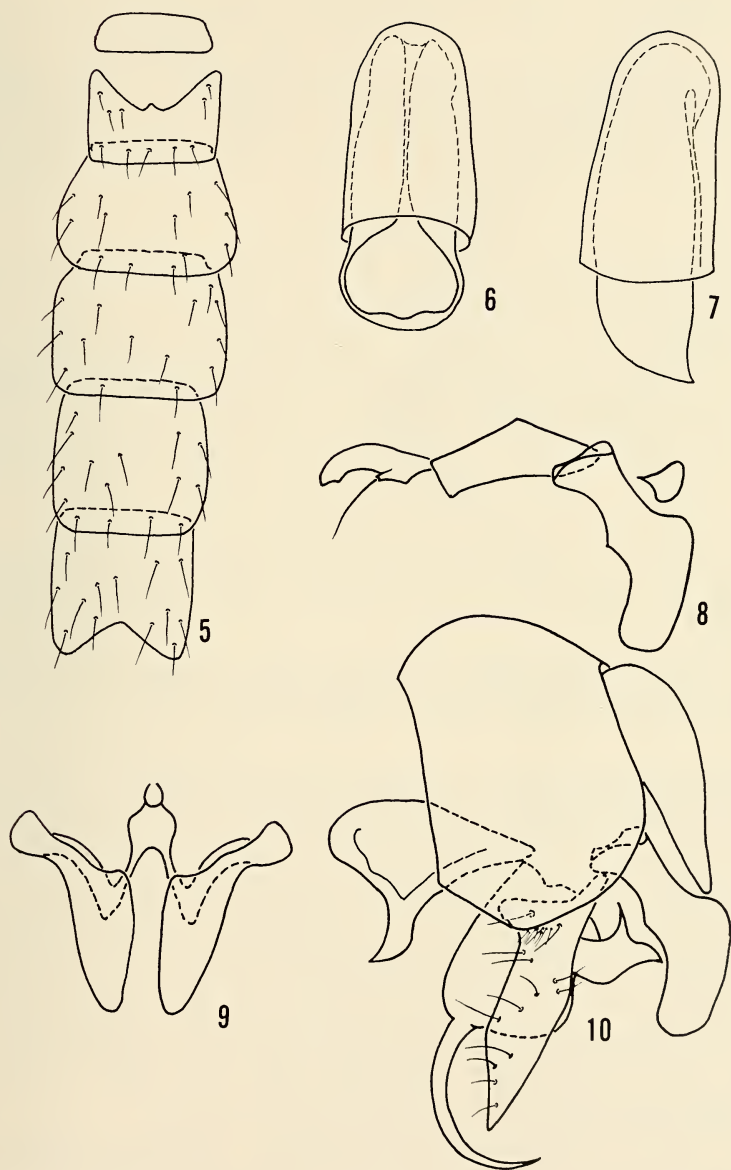
Etymology.—*Liroceras* is a combination of the Greek adjective *leiros* (Latin transcription *liros*), meaning "pale" and the noun *ceras*, meaning "horn," in allusion to the pale third antennal segment. The name stands in apposition to the generic name.

Remarks.—The single male specimen was badly damaged although its abdomen was intact, permitting preparation of the genitalic structures for illustration.

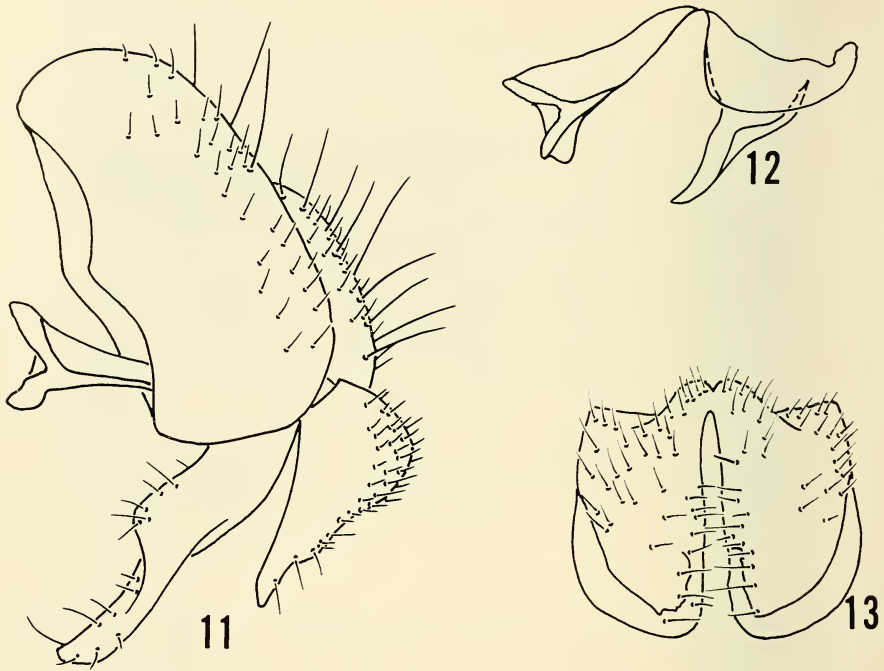
Eleleides chloris Cresson

Figs. 11-13

Eleleides chloris Cresson, 1948:20. Wirth, 1968:142 (review, figures of male genitalia).



Figs. 5-10. *Eleleides liroceras*: 5, Sterna 1-6 of female; 6, Female ventral receptacle; 7, Same; 8, Gonol arch and surstyli of male, lateral view; 9, Surstyli, posterior view; 10, Male genitalia, lateral view.



Figs. 11–13. *Eleleides chloris*: 11, Male genitalia, lateral view; 12, Aedeagal apodeme and aedeagus, lateral view; 13, Surstyli, posterior view.

Diagnosis.—Specimens of *E. chloris* are distinguished by the following combination of characters: eye-to-cheek ratio less than 1:0.25; third antennal segment black, appearing pubescent; frons except for cinereous anterior margin shiny, concolorous with dorsal portion of face, dark bluish green; maxillary palp black; mesonotum more or less uniformly shiny, mostly unicolorous, slightly brassy greenish blue; bristles, especially dorsocentrals, more weakly developed; frequently with one larger pair of acrostichal bristles at level of suture; anterior supra-alar bristle present; femora and tibiae concolorous, dark, but with some surfaces appearing cinereous and lustrous from some angles; abdominal terga unicolorous, dark bluish green, shiny. Male genitalia as in Figs. 11, 12, and 13.

Type-material.—Holotype female, labelled: “Victoria (Australia) 1888 (hand written)/♂/yellowish-orange rectangle/Type (pink, hand written)/6678 TYPE *Eleleides chloris* Cress. (red).” The holotype is in the Academy of Natural Sciences of Philadelphia, type-number 6678. Contrary to what Cresson (1948) cited, the holotype is a female specimen. No other specimens of the type-series could be found although Cresson listed 3 male and 2 female paratypes with the same label data as the holotype.

Geographic distribution.—Southeastern Australia between 30° and 38° south latitude (states of New South Wales, including Australian Capital Territory, and Victoria).

Natural history.—Wirth (personal communication) collected a series of this species from near the town of Griffith (N.S.W.) in November, 1956, by sweeping emergent vegetation from marshy areas adjacent to a freshwater creek.

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